Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A cut-through path control method at a router device at which multi-path exists, comprising:

selecting one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path; and

carrying out a prescribed control for setting up the cut-through path with said one router as the next hop router,

wherein the selecting step selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are uniformly distributed among said plurality of routers[[.]],

wherein the selecting step includes the sub-steps of:

assigning possible residue values starting from 0 that are obtainable by dividing a given integer by a total number of said plurality of routers, respectively to said plurality of routers, one residue value per each router; and

selecting one of said plurality of routers which is assigned with a residue value obtained by dividing the number of already set up cut-through paths by the total number of said plurality of routers as said one router.

2. Canceled.

3. Canceled.

4. Canceled.

5. (Currently Amended) ~~The method of claim 4,~~ A cut-through path control method at a router device at which multi-path exists, comprising:

selecting one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path; and

carrying out a prescribed control for setting up the cut-through path with said one router as the next hop router,

wherein the selecting step selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are evenly distributed among said plurality of routers according to link rates with respect to said plurality of routers,

wherein the selecting step includes the sub-steps of:

assigning possible residue values starting from 0 that are obtainable by dividing a given integer by a total of elements constituting an integer ratio indicating or approximating a ratio of the link rates with respect to said plurality of routers, respectively to said plurality of routers, as many residues values as a number proportional to a link rate with respect to each router per each router; and

selecting one of said plurality of routers which is assigned with a residue value obtained by dividing the number of already set up cut-through paths by the total of the elements constituting the integer ratio as said one router.

6. (Original) The method of claim 1, further comprising the steps of:

sending a message for setting up the cut-through path to said one router; and

making an information setting necessary for utilizing the cut-through path when the cut-through path is set up.

7. (Original) The method of claim 1, further comprising the steps of:

sending a message for setting up the cut-through path to said one router when no other already set up cut-through path to said one router exists, and making an information setting necessary for utilizing the cut-through path when the cut-through path is set up; and

making another information setting necessary for merging the cut-through path with an already set up cut-through path to said one router when the already set up cut-through path exists.

8. (Original) The method of claim 1, wherein the setting up of the cut-through path starts at a timing of receiving a message for setting up the cut-through path from a node device on an upstream side.

9. (Original) The method of claim 1, further comprising the steps of:

selecting one cut-through path that contributes to the load balancing when a route change is made, among cut-through paths for which the route change at the router device is possible; and

changing a route of said one cut-through path so as to contribute to the load balancing.

10. Canceled.

11. (Currently Amended) The method of claim [[10]] 9, further comprising the step of:

checking a traffic amount to each of a plurality of node devices that are next hop nodes of cut-through paths from the router device at prescribed timings;

wherein the selecting step selects said one cut-through path that satisfies a prescribed condition regarding the traffic amount when a level of imbalance among traffic amounts to said plurality of node devices exceeds a prescribed tolerable range, said one cut-through path being in a multi-path with one node device with less traffic amount as a next hop node; and

the changing step changes the route of said one cut-through path by changing the next hop node of said one cut-through path to another node device with more traffic amount.

12. (Original) The method of claim 11, wherein the selecting step and the changing step are repeated until the level of imbalance becomes within the prescribed tolerable range or there is no more cut-through path that can be selected by the selecting step.

13. (Original) The method of claim 11, wherein the selecting step selects one or a plurality of optimal solutions for said one cut-through path.

14. (Currently Amended) A router device at which multi-path exists, comprising:

a processing unit configured to select one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a

prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

a control unit configured to carry out a prescribed control for setting up the cut-through path with said one router as the next hop router; and

a transfer unit configured to transfer datagrams using the cut-through path,

wherein the processing unit selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are uniformly distributed among said plurality of routers[[.]] ,

wherein the processing unit:

assigns possible residue values starting from 0 that are obtainable by dividing a given integer by a total number of said plurality of routers, respectively to said plurality of routers, one residue value per each router; and

selects one of said plurality of routers which is assigned with a residue value obtained by dividing the number of already set up cut-through paths by the total number of said plurality of routers as said one router.

15. Canceled.

16. (Currently Amended) ~~The router device of claim 14,~~ A router device at which multi-path exists, comprising:

a processing unit configured to select one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

a control unit configured to carry out a prescribed control for setting up the cut-through path with said one router as the next hop router; and

a transfer unit configured to transfer datagrams using the cut-through path,

wherein the processing unit selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that the numbers of cut-through paths at said plurality of routers are evenly distributed among said plurality of routers according to link rates with respect to said plurality of routers[[.]] ,

wherein the processing unit:

assigns possible residue values starting from 0 that are obtainable by dividing a given integer by a total of elements constituting an integer ratio indicating or approximating a ratio of the link rates with respect to said plurality of routers, respectively to said plurality of routers, as many residues values as a number proportional to a link rate with respect to each router per each router; and

selects one of said plurality of routers which is assigned with a residue value obtained by dividing the number of already set up cut-through paths by the total of the elements constituting the integer ratio as said one router.

17. (Currently Amended) [A] The router device of claim 14 ~~at which multi-path exists~~, further comprising:

a selecting ~~processing~~ unit configured to select one cut-through path that contributes to a load balancing when a route change is made, among cut-through paths for which the route change at the router device is possible;

a route changing ~~control~~ unit configured to change a route of said one cut-through path so as to contribute to the load balancing~~; and~~

~~a transfer unit configured to transfer datagrams using the cut-through path,~~

~~wherein the control unit changes the route of said one cut-through path according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at a plurality of routers are uniformly distributed among said plurality of routers which can possibly be a next hop router~~.

18. (Currently Amended) The router device of claim 17, further comprising:

a measurement unit configured to check a traffic amount to each of a plurality of node devices that are next hop nodes of cut-through paths from the router device at prescribed timings;

wherein the selecting ~~processing~~ unit selects said one cut-through path that satisfies a prescribed condition regarding the traffic amount when a level of imbalance among traffic amounts to said plurality of node devices exceeds a prescribed tolerable range, said one cut-through path being in a multi-path with one node device with less traffic amount as a next hop node; and

the route changing ~~control~~ unit changes the route of said one cut-through path by changing the next hop node of said one cut-through path to another node device with more traffic amount.

19. (Currently Amended) A computer usable medium having computer readable program code embodied therein for causing a computer to function as a router device at which multi-path exists, the computer readable program code comprising:

first computer readable program code for causing said computer to select one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

second computer readable program code for causing said computer to carry out a prescribed control for setting up the cut-through path with said one router as the next hop router; and

third computer readable program code for causing said computer to transfer datagrams using the cut-through path,

wherein the first computer readable program code causes said computer to select said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are uniformly distributed among said plurality of routers[[.]],

wherein the first computer readable program code causes said computer to:

assign possible residue values starting from 0 that are obtainable by dividing a given integer by a total number of said plurality of routers, respectively, to said plurality of routers, one residue value per each router; and

select one of said plurality of routers which is assigned with a residue value obtained by dividing the number of already set up cut-through paths by the total number of said plurality of routers as said one router.

20. (Currently Amended) ~~A computer usable medium having computer readable program code embodied therein for causing a computer to function as a router device at which multi-path exists, the~~ The computer readable program code of claim 19, further comprising:

fourth ~~first~~ computer readable program code for causing said computer to select one cut-through path that contributes to a load balancing when a route change is made, among cut-through paths for which the route change at the router device is possible; and

fifth ~~second~~ computer readable program code for causing said computer to change a route of said one cut-through path so as to contribute to the load balancing~~; and~~ .

~~third computer readable program code for causing said computer to transfer datagrams using the cut-through path,~~

~~wherein the second computer readable program code causes said computer to change the route of said one cut-through path according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at a plurality of routers are uniformly distributed among said plurality of routers which can possibly be a next hop router.~~

21. (Currently Amended) The method of claim 8 [[1]], ~~wherein the setting up of the cut-through path starts at a timing of receiving a message for setting up the cut-through path from a node device on an upstream side of said router device, and~~

wherein said selecting step selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node that is also included in the message for setting up the cut-through path that is received by said router device.

22. (Previously Presented) The router device of claim 14, wherein the control unit sends a message for setting up the cut-through path to said one router, and makes an information setting necessary for utilizing the cut-through path when the cut-through path is set up.

23. (New) The method of claim 5, further comprising the steps of:

sending a message for setting up the cut-through path to said one router; and

making an information setting necessary for utilizing the cut-through path when the cut-through path is set up.

24. (New) The method of claim 5, further comprising the steps of:

sending a message for setting up the cut-through path to said one router when no other already set up cut-through path to said one router exists and making an information setting necessary for utilizing the cut-through path when the cut-through path is set up; and

making another information setting necessary for merging the cut-through path with an already set up cut-through path to said one router when the already set up cut-through path exists.

25. (New) The method of claim 5, wherein the setting up of the cut-through path starts at a timing of receiving a message for setting up the cut-through path from a node device on an upstream side.

26. (New) The method of claim 25, wherein said selecting step selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node that is also included in the message for setting up the cut-through path that is received by said router device.

27. (New) The method of claim 5, further comprising the steps of:

selecting one cut-through path that contributes to the load balancing when a route change is made, among cut-through paths for which the route change at the router device is possible; and

changing a route of said one cut-through path so as to contribute to the load balancing.

28. (New) The method of claim 27, further comprising the step of:

checking a traffic amount to each of a plurality of node devices that are next hop nodes of cut-through paths from the router device at prescribed timings;

wherein the selecting step selects said one cut-through path that satisfies a prescribed condition regarding the traffic amount when a level of imbalance among traffic amounts to said plurality of node devices exceeds a prescribed tolerable range, said one cut-through path being in a multi-path with one node device with less traffic amount as a next hop node; and

the changing step changes the route of said one cut-through path by changing the next hop node of said one cut-through path to another node device with more traffic amount.

29. (New) The method of claim 28, wherein the selecting step and the changing step are repeated until the level of imbalance becomes within the prescribed tolerable range or there is no more cut-through path that can be selected by the selecting step.

30. (New) The method of claim 28, wherein the selecting step selects one or a plurality of optimal solutions for said one cut-through path.

31. (New) The router device of claim 16, further comprising:

a selecting unit configured to select one cut-through path that contributes to a load balancing when a route change is made, among cut-through paths for which the route change at the router device is possible; and

a route changing unit configured to change a route of said one cut-through path so as to contribute to the load balancing.

32. (New) The router device of claim 31, further comprising:

a measurement unit configured to check a traffic amount to each of a plurality of node devices that are next hop nodes of cut-through paths from the route device at prescribed timings;

wherein the selecting unit selects said one cut-through path that satisfies a prescribed condition regarding the traffic amount when a level of imbalance among traffic amounts to said plurality of node devices exceeds a prescribed tolerable range, said one cut-through path being in a multi-path with one node device with less traffic amount as a next hop node; and

the route changing unit changes the route of said one cut-through path by changing the next hop node of said one cut-through path to another node device with more traffic amount.

33. (New) The router device of claim 16, wherein the control unit sends a message for setting up the cut-through path to said one router, and makes an information setting necessary for utilizing the cut-through path when the cut-through path is set up.

34. (New) A computer usable medium having computer readable program code embodied therein for causing a computer to function as a router device at which multi-path exists, the computer readable program code comprising:

first computer readable program code for causing said computer to select one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

second computer readable program code for causing said computer to carry out a prescribed control for setting up the cut-through path with said one router as the next hop router; and

third computer readable program code for causing said computer to transfer datagrams using the cut-through path,

wherein the first computer readable program code causes said computer to select said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are evenly distributed among said plurality of routers according to link rates with respect to said plurality of routers,

wherein the first computer readable program code causes said computer to:

assign possible residue values starting from 0 that are obtainable by dividing a given integer by a total of elements constituting an integer ratio indicating or approximating a ratio of the link rates with respect to said plurality of routers, respectively to said plurality of routers, as many residues values as a number proportional to a link rate with respect to each router per each router; and

select one of said plurality of routers which is assigned with a residue value obtained by dividing the number of already set up cut-through paths by the total of the elements constituting the integer ratio as said one router.

35. (New) The computer readable program code of claim 34, further comprising:

fourth computer readable program code for causing said computer to select one cut-through path that contributes to a load balancing when a route change is made, among cut-through paths for which the route change at the router device is possible; and

fifth computer readable program code for causing said computer to change a route of said one cut-through path so as to contribute to the load balancing.

36. (New) A cut-through path control method at a router device at which multi-path exists, comprising:

selecting one router among a plurality of routers that can possibly be a net hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path; and

carrying out a prescribed control for setting up the cut-through path with said one router as the next hop router,

wherein the selecting step selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are uniformly distributed among said plurality of routers,

wherein the selecting step includes the sub-steps of:

assigning operation values obtained by carrying out a prescribed operation for possible residue values starting from 0 that re obtainable by dividing a given integer by a total number of said plurality of routers, respectively to said plurality of routers, one operation value per each router; and

selecting one of said plurality of routers which is assigned with an operation value obtained by carrying out the prescribed operation for a residue value obtained by dividing the number of already set up cut-through paths by the total number of said plurality of routers as said one router.

37. (New) A cut-through path control method at a router device at which multi-path exists, comprising:

selecting one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path; and

carrying out a prescribed control for setting up the cut-through path with said one router as the next hop router,

wherein the selecting step selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that

numbers of cut-through paths at said plurality of routers are evenly distributed among said plurality of routers according to link rates with respect to said plurality of routers,

wherein the selecting step includes the sub-steps of:

assigning operation values obtained by carrying out a prescribed operation for possible residue values starting from 0 that are obtainable by dividing a given integer by a total of elements constituting an integer ratio indicating or approximating a ratio of the link rates with respect to said plurality of routers, respectively to said plurality of routers, as many operation values as a number proportional to a link rate with respect to each router per each router; and

selecting one of said plurality of routers which is assigned with an operation value obtained by carrying out the prescribed operation for a residue value obtained by dividing the number of already set up cut-through paths by the total of the elements constituting the integer ratio as said one router.

38. (New) A router device at which multi-path exists, comprising:

a processing unit configured to select one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

a control unit configured to carry out a prescribed control for setting up the cut-through path with said one router as the next hop router; and

a transfer unit configured to transfer datagrams using the cut-through path,

wherein the processing unit selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are uniformly distributed among said plurality of routers,

wherein the processing unit:

assigns operation values obtained by carrying out a prescribed operation for possible residue values starting from 0 that are obtainable by dividing a given integer by a total number of said plurality of routers, respectively to said plurality of routers, one operation value per each router; and

selects one of said plurality of routers which is assigned with an operation value obtained by carrying out the prescribed operation for a residue value obtained by

dividing the number of already set up cut-through paths by the total number of said plurality of routers as said one router.

39. (New) A router device at which multi-path exists, comprising:

a processing unit configured to select one router among a plurality of routers that can possibly be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

a control unit configured to carry out a prescribed control for setting up the cut-through path with said one router as the next hop router; and

a transfer unit configured to transfer datagrams using the cut-through path,

wherein the processing unit selects said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that the numbers of cut-through paths at said plurality of routers are evenly distributed among said plurality of routers according to link rates with respect to said plurality of routers,

wherein the processing unit:

assigns operation values obtained by carrying out a prescribed operation for possible residue values starting from 0 that are obtainable by dividing a given integer by a total of elements constituting an integer ratio indicating or approximating a ratio of the link rates with respect to said plurality of routers, respectively to said plurality of routers, as many operation values as a number proportional to a link rate with respect to each router per each route; and

selects one of said plurality of routers which is assigned with an operation value obtained by carrying out the prescribed operation for a residue value obtained by dividing the number of already set up cut-through paths by the total of the elements constituting the integer ratio as said one router.

40. (New) A computer usable medium having computer readable program code embodied therein for causing a computer to function as a router device at which multi-path exists, the computer readable program code comprising:

first computer readable program code for causing said computer to select one router among a plurality of routers that can possible be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of

cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

second computer readable program code for causing said computer to carry out a prescribed control for setting up the cut-through path with said one router as the next hope router; and

third computer readable program code for causing said computer to transfer datagrams using the cut-through path,

wherein the first computer readable program code causes said computer to select said one router according to a number of already set up cut-through paths that are used to route packets to a same destination node such that numbers of cut-through paths at said plurality of routers are uniformly distributed among said plurality of routers,

wherein the first computer readable program code causes said computer to:

assign operation values obtained by carrying out a prescribed operation for possible residue values starting from 0 that are obtainable by dividing a given integer by a total number of said plurality of routers, respectively to said plurality of routers, one operation value per each router; and

select one of said plurality of routers which is assigned with an operation value obtained by carrying out the prescribed operation for a residue value obtained by dividing the number of already set up cut-through paths by the total number of said plurality of routers as said one router.

41. (New) A computer usable medium having computer readable program code embodied therein for causing a computer to function as a router device at which multi-path exists, the computer readable program code comprising:

first computer readable program code for causing said computer to select one router among a plurality of routers that can possible be a next hop router so as to contribute to a load balancing, according to a whole or a prescribed part of information regarding a state of cut-through path set up in which the router device is involved, at a time of setting up a cut-through path in the multi-path;

second computer readable program code for causing said computer to carry out a prescribed control for setting up the cut-through path with said one router as the next hop router; and

third computer readable program code for causing said computer to transfer datagrams using the cut-through path,

wherein the first computer readable program code causes said computer to select said one router according to a number of already set up cut-through paths that are used to route packet to a same destination node such that numbers of cut-through paths at said plurality of routers are evenly distributed among said plurality of routers according to link rates with respect to said plurality of routers,

wherein the first computer readable program code causes said computer to:

assign operation values obtained by carrying out a prescribed operation for possible residue values starting from 0 that are obtainable by dividing a given integer by a total of elements constituting an integer ratio indicating or approximating a ratio of the link rates with respect to said plurality of routers, respectively to said plurality of routers, as many operation values as a number proportional to a link rate with respect to each router per each router; and

select one of said plurality of routers which is assigned with an operation value obtained by carrying out the prescribed operation for a residue value obtained by dividing the number of already set up cut-through paths by the total of the elements constituting the integer ratio as said one router.